Abstract of the Disclosure

A SHARED RESOURCE QUEUE FOR SIMULTANEOUS MULTITHREADED PROCESSING

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A queue, such as a first-in first-out queue, is incorporated into a
processing device, such as a multithreaded pipeline processor. The queue
may store the resources of more than one thread in the processing device
such that the entries of one thread may be interspersed among the entries of
another thread. The entries of each thread may be identified by a thread
identification, a valid marker to indicate if the resources within the entry are
valid, and a bank number. For a particular thread, the bank number tracks
the number of times a head pointer pertaining to the first entry has passed a
tail pointer. In this fashion, empty entries may be used and the resources
may be efficiently allocated. In a preferred embodiment, the shared resource
queue may be implemented into an in-order multithreaded pipelined
processor as a queue storing resources to be dispatched for execution of
instructions. The shared resource queue may also be implemented into a
branch information queue or into any queue where more than one thread
may require dynamic registers.